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HOUSING REHABILITATION AND ITS ROLE IN NEIGHBORHOOD CHANGE: A FRAMEWORK FOR EVALUATION

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In most empirical studies of neighborhood change, particularly those on the issue of gentrification, the analysis focuses either on variations in population, transformations in the housing market, or modifications in the physical condition of buildings, without attending to the interaction of these different but interrelated aspects of residential change. Moreover, variations within a geographical area are lost since statistical data used pertain to areas larger than the neighborhoods themselves. Here, a framework of analysis that combines three aspects of neighborhood change, namely, changes in the physical stock, the housing market, and the population, is proposed. Data in these categories are collected at the level of individual properties and their interaction is studied. Various sequences and patterns of occurrence of these three aspects of residential change are argued to imply different intentions behind the practices of the many actors involved. Hence, the proposed framework clarifies the complexity of the process of neighborhood change and uncovers the dynamics behind it. This approach is applied to an inner city neighborhood in Pittsburgh, Pennsylvania (USA), in order to discuss and evaluate transformations experienced in the area in the 1980s.

INTRODUCTION

Housing rehabilitation activity plays an under-analyzed role in neighborhood theory although it is one of the most visible forms of neighborhood change. The qualitative and quantitative aspects of the physical stock and variations therein are often neglected, treating renovation as a homogeneous activity. Neither is their interaction with other dimensions of neighborhood change extensively analyzed. Studies of neighborhoods emphasize either demographic and socio-economic changes and the overall activity within the residential property market only, or the socio-political dimension of neighborhood change (Bridge, 1994; DeGiovanni, 1983; Goetze, 1979; Ley, 1994; Pattison, 1983; Smith, 1979, 1982; Warde, 1991). While one needs to study and interpret secondary data on geographical areas to assess changes in socio-economic composition and property values, renovated buildings are direct indications of investment and change. To the extent that the effects of rehabilitation are not limited to the visible improvement of the physical stock but also extend to increases in property values, with property values affecting socio-economic composition, rehabilitation ultimately connects to the types of changes typically emphasized in neighborhood theory.

Studies that focus on housing rehabilitation and its connection with other aspects of neighborhood change, such as property values, investment in improvements, and length of stay, are limited (Clay, 1979; Galster, 1987; Jager, 1986; Maher, *et al.*, 1985; Myers, 1984). Nevertheless, the condition of the physical stock is an important factor in determining a neighborhood's status, whether declining, improving, or stable (Hoover and Vernon, 1962; Birch, 1971; Grigsby, *et al.*, 1977; Downs, 1981; LaGory and Pipkin, 1981). While a declining neighborhood is characterized by run-down properties, physical deterioration, and lack of investment, an improving neighborhood exhibits tangible signs of investment, ranging from basic maintenance to major rehabilitation. Hence, actions that qualitatively alter the physical condition of buildings have a role in neighborhood change. Furthermore, variations in the physical quality of neighborhoods often lead to changes in investment and turnover of population. That is, people "read" the tendency towards amelioration or deterioration of neighborhoods in terms of changes in the built environment. Yet, most researchers and theorists treat renovation as an insignificant outcome of improvements in other aspects of a neighborhood, rather than as an important independent force. Only recently, with the emerging emphasis on "space," physical setting, and geography, have there been discussions on the role of space, together with power and resources, as a critical variable in the changes within inner cities (Wilson, 1993). Even in these studies, space is treated as locality, without elaborating on its particularities (Brun and Fagnani, 1994). The role of renovation in neighborhood change has not been analyzed from the perspective of cause and effect. If it is a cause, is it an important one or not? If it is a cause of some effects and effect of some other causes, does the role of renovation vary throughout the process of neighborhood change? Does this role change from one neighborhood to another, or over time within the same neighborhood?

This paper is based on the premise that rehabilitation is significant for neighborhood change, that there may be many different ways it is experienced, and that its interaction with other measures is crucial in understanding this process. The aim is to propose an approach to analyze and clarify the intricate relationship among various indicators of change within a neighborhood. Just as decline in the urban context represents a complex array of meanings and necessitates "unpacking" of these meanings to demystify the process (Beauregard, 1993), changes in an urban neighborhood cannot be studied and understood solely through analyzing the physical condition of the built environment. "Unpacking" the meanings of physical change and its interaction with other dimensions of change is needed. This framework incorporates the role of rehabilitation into neighborhood dynamics and, in this instance, the particularities of renovation in an upgrading neighborhood. It is a housing-oriented approach that looks at the "internal" dynamics of a neighborhood, the built environment, and the relation between changes in ownership and occupancy. In order to attain this objective, the research incorporates an in-depth analysis of data that reflect various aspects of renovation activity at the scale of individual properties and their interaction with property sales and the turnover of residents. Contrary to the arguments about the necessity of studying such changes in neighborhoods at city-wide scale (Bridge, 1994), incorporating data at property scale is suggested here to overcome the limitations brought by aggregate data where variations among individual cases are lost. It is argued that a

close look at specific areas within rehabilitating neighborhoods reveals important variations hidden in summary data and helps uncover the complexity of the processes taking place there (Wagner, 1995). The interaction between all these dimensions of change, in turn, needs to be discussed in relation to changes in the larger neighborhood and the city and in connection to the public policy framework. In other words, the dynamics of rehabilitation activity in a particular area must be related to forces set by the urban context and to the contingencies defined by the agents directly or indirectly involved in rehabilitation. However, since the focus of the paper is on the introduction of a particular framework of study, changes in the neighborhood in relation to the urban context will be discussed quite briefly.

The approach proposed here attends to three major questions. First, what happens to the housing stock in a neighborhood undergoing significant upgrading? Second, what kinds of renovation activity occur? And third, what consequences do they have for property sales and turnover of residents?

PROPOSED FRAMEWORK OF ANALYSIS

Neighborhood change cannot be studied singularly at the neighborhood level; changes that are manifested at the level of individual properties also need to be considered. Neighborhood data essentially give aggregate information where most of the changes are leveled out, especially when the neighborhood covers a large area. Variations among individual cases that make up the whole, the range of these variations, and their geographic distribution are lost (Wagner, 1995). This becomes a particular problem in neighborhoods where renovation activity is uneven; that is, concentrated on certain blocks, and even localized to portions of blocks. In such cases, neighborhood level data do not directly reflect what happens at property level, causing spatial variations to be lost.

The purpose of analysis at property level is to identify the particularities of each property and its uniqueness, rather than to reduce the complexity of events to simplifying generalities. That is, by studying the particular history of each property in terms of changes in ownership, in occupants, and in physical condition, it will be possible to uncover the patterns of similar histories among the properties. Hence, instead of having aggregate values in each one of these categories for the whole neighborhood, their combined effect for each property and the order in which they occur in time is proposed to be the basis of analysis. It is argued that such an approach enables us to explain the various types of changes and to discuss the outcomes in relation to the possible underlying intentions. Descriptive and inferential statistics and numerical analyses will also be incorporated to discover common properties and general patterns among these properties in the area.

Concepts and Terminology

Before addressing the data and the analytical strategies used, it will be helpful to clarify terminology and concepts. "Property" is defined as any object of value, subject to ownership by persons. Here, it is used in the sense of "real property;" i.e. fixed capital invested in building, excluding the land due to the particular focus of the paper, that is, studying the role of building renovation in neighborhood change. Hence, the possible spill-over effect of renovated buildings on the property values of vacant land is not considered. According to the approach proposed in this paper, each individually owned residential unit is considered a property.

Any act of ameliorating or upgrading the physical condition of properties is defined as "renovation." Renovation may range from basic maintenance to extensive repair depending on the level, type, and degree of upgrading. Painting and clean-up are considered basic maintenance or minor renovation, while extensive or major renovation includes major structural modifications, such as lifting the floors, removing the ceilings, or altering the layout. In this study, renovation is categorized both in terms of the level of intervention, such as major and minor renovation, and also on whether it is exterior, interior, or general renovation, depending on the purposes of particular analyses.

"Residential turnover" refers to a change in the occupants of a residential unit. It might or might not involve a change in ownership. It could include turnover of owner-occupants, turnover of tenants, replacing tenants with owner-occupants when rental property turns into an owner-occupied one, and replacing owners with tenants when owner-occupied property turns into rental property.

Transactions that affect the ownership of properties are called "property sales." Differentiation can be made between the types of transactions — "arm's-length" transaction, inheritance, or subsidized sales. Sale of property may or may not lead to turnover of residents — owners or tenants. In most of the cases, sale of an owner-occupied property leads to turnover of the occupants, though there may be exceptions.

Data Types

Three types of data are suggested for property level analysis: renovation activity, the sale of property, and the resident turnover. Renovation activity data consist of information on renovation type, date, and cost. Building permits, such as the records of building inspection offices, can be used for this purpose, as long as they include various levels of interventions. Renovation data used in this study include actions such as rehabilitation, general repair, remodeling, change in the number of units, extension, addition, interior alterations, bathroom or kitchen renewal, façade renewal, exterior alteration, wall repair, roof repair, stairwell repair, addition of deck, porch, fire escape, dormer, skylight, repair of garage, and application of drywall, plaster, fence, insulation. This information enables us to get a broad understanding of the nature of renovation activity and how it varies in time. Using data on renovation, we can study how different aspects of physical change — the type, degree, and cost of the renovation — are related to residential turnover and property sales, and also whether there is any predominant pattern among these measures of residential change.

Information on property sales, including the date of sale and the sale value, is the second category of data. It can be obtained from the deed registry records of local administrations. For each property, it is possible to study variations in sale values and to relate this trend with the history of recorded renovations of the property. Through this property-based information, trends of property value changes in the aggregate, and the relation between these trends and those in renovation activity can be studied to find whether they are related, and, if so, to explore the nature of this relation in terms of their timing and the type and cost of renovation.

The third data set concerns occupants and their turnover for each property over the study period. Reverse directories that list the inhabitants by their address can be used as sources of secondary data, if collecting primary data about the inhabitants using interviews or questionnaires is not possible. Information on the length of stay of each resident at a particular address, frequency of turnover of residents, subdivisions of properties, especially if data on the socio-economic characteristics of the past and present residents are available, are strong clues for the nature of changes in an area.

Major Questions

The proposed framework to study neighborhood rehabilitation should have the potential to answer some of the questions that are central to neighborhood change: Firstly, what happens to the housing stock in a neighborhood that is undergoing significant upgrading? More specifically, what kind of renovation activity occurs in such neighborhoods? What are the specific characteristics of each renovation activity in terms of cost, date, duration, and level of intervention? How is renovation activity distributed over time? Secondly, what consequences does it have for property sales and residential turnover? That is, are they related directly and significantly? If they are, is there a regularity to this relationship in terms of types, costs, and timing of renovation? Does this interaction change with respect to the stage of the rehabilitation process? Are there predominant patterns of occurrence among renovation, property sale, and turnover of residents? Can these patterns be assumed as clues for the intentions behind renovation? If so, what are the possible intentions?

This list can be extended; however, these are the major issues that need to be addressed while studying changes in a rehabilitating area. The framework of analysis proposed here is argued to be capable of scrutinizing such complexities of neighborhood change.

Analytical Techniques

There are many ways neighborhood change is manifested, each process representing a different set of intentions, just like the difference between a large-scale developer renovating numerous old buildings and individual households improving their own houses (Warde, 1991). Hence, different analytical techniques need to be applied in order to clarify the variety of changes in a neighborhood. First, time series analyses of number and types of renovation, money spent for renovation, number of sales, and the sale values of renovated and non-renovated properties in the neighborhood need to be performed to understand the general trends in the neighborhood. Then, renovation, property sale, and residential turnover should be analyzed non-sequentially in order to see whether there is significant relationship among them. Cross-tabulations between the number of instances of renovation and sale, renovation and turnover, and sale and turnover can be used for this purpose. Yet, as discussed earlier, such descriptive information falls short of uncovering the interaction among individual events. Thus, the analysis should be taken a step further to focus on the timing of the occurrences of renovation, sale, and turnover of residents — their sequencing. This would show instances of precedence and concurrence, hence revealing underlying motives, since the ordering of events in time is argued to be a clue for intentions.

The proposed approach to studying changes in a revitalizing area enables us to discuss the nature of intervention using the findings of descriptive statistics together with those of sequential analysis. Hence, statistical information about trends in the type, degree, and cost of renovation, sale price, occupants and their turnover to understand changes in these terms, accompanied with information about the timing of these indicators with respect to each other, all become clues to explain different aspects of neighborhood change and solve the puzzle of this complex process. A number of possible outcomes are discussed below.

Renovations that precede a sale are done for anonymous prospective occupants, hence, are market-oriented. This is the case when developers buy properties to renovate and sell at a higher price than they bought. Renovations that follow a change in ownership and probably a turnover of residents, on the other hand, imply a desire to increase the fit between the building and the occupants' needs and tastes, hence, are not speculative. People buying property in older neighborhoods to renovate and then inhabit them are examples. Renovations in these two instances are expected to exhibit different characteristics: renovations done with the intention of increasing marketability are expected to be more substantial, more costly, and exterior-oriented compared to the ones that are done after the sale of property to increase the utility and delight of the building for the new occupants. Examples in the latter case are expected to be mostly interior renovations.

Renovations that do not accompany property sale and turnover of residents are done by owner-occupants and are taken as examples of "incumbent upgrading," that is, people rehabilitating their own houses without moving out (Clay, 1979). Instances where there are no changes in ownership but turnover of residents occurs after renovation may indicate a change in the occupancy status — rental property turned into owner-occupied or vice versa. If the property is rented after renovation, we may assume increasing the rent is the motive behind the action.

Property sales that occur simultaneously with resident turnover, without any renovation, might be speculative since the appreciation of property, if there is any, is not due to the investments made. The intention in such instances is to collect value increases due to the spill-over effect of renovations on nearby properties.

If the properties are sold and renovated at the same time, accompanied by a change in occupants, then it indicates that the potential of renovation attracts new households into the area. Depending on the

TABLE 1. "Scenarios" of neighborhood change.

Type A	No change in ownership or turnover of occupancy at the time of renovation. Renovation is done by the owner-occupant. *Incumbent upgrading, the goal is not to attract a different type of household.*
Type B	Renovation leads to a turnover of the residents but the property is not sold (the turnover of tenants, or turning a rental property into owner-occupancy, or an owner-occupant moving out to rent the place). *The objective of renovation is to make the property fit a new clientele*, and, if it becomes completely rental after renovation, *to collect higher rents.*
Type C	Renovation occurs after a property is purchased/occupied by the new owner. *The intention is to make the building match the needs and tastes of the new owner-occupants.* These new residents might be *gentrifiers*, depending on their socioeconomic characteristics and on the characteristics of the larger neighborhood.
Type D	Property is renovated and sold after or during renovation. *Renovation is profit-oriented*, and might be *speculative.* (Instances where renovation starts after a purchase and the property is sold after renovation also fit in this category.)

socio-economic characteristics of the newcomers and the previous residents, these instances might be examples of gentrification (Beauregard, 1986; Laska and Spain, 1979).

The type and degree of renovation is assumed to reflect the intention of the agent who does the renovation. If the renovation is undertaken by the original owner-occupants, it is expected to be basic maintenance or moderate renovation to increase the building's utility. If the renovation is done by an agent who does not occupy the building, the primary intention would be to increase its market value, hence, to increase either the rent or sale price. Thus, if the prospects are high for selling the property for a larger amount than the previous sale price, or renting it for an amount more than the current rent, then the renovation will target a different clientele than the existing one, and it will be qualitatively more extensive and quantitatively more costly. Extensive renovation could be done by an owner, but usually just after purchase and before the unit is occupied. This has been the case with households buying "shells" in gentrifying neighborhoods.

Renovation activity in the early years of neighborhood rehabilitation is expected to be modest. Extensive and more elaborate renovations occur later in the process. Hence, renovations would get more expensive through the study years. Similarly, sale values are expected to increase with time. Verification of these hypotheses will support the stage theories of neighborhood revitalization which suggest that the rehabilitation efforts in a neighborhood change qualitatively throughout the process (Pattison, 1983).

The sequential or simultaneous occurrence of events is suggested to indicate the intention behind renovation. Based on the discussion above, four types of "scenarios" — actors and their objectives in renovation — are developed (Table 1).

These types represent the most commonly expected sequence or occurrence of events in a changing neighborhood. Thus, only those events that would be meaningful in terms of the changes the area is going through and those cases which involve renovation are included, not all the possible combinations.

A CASE OF NEIGHBORHOOD CHANGE — MEXICAN WAR STREETS OF PITTSBURGH

The above framework to studying neighborhood revitalization was used to analyze changes that occurred in the Mexican War Streets area in Pittsburgh, Pennsylvania, between 1981 and 1990. Pre-

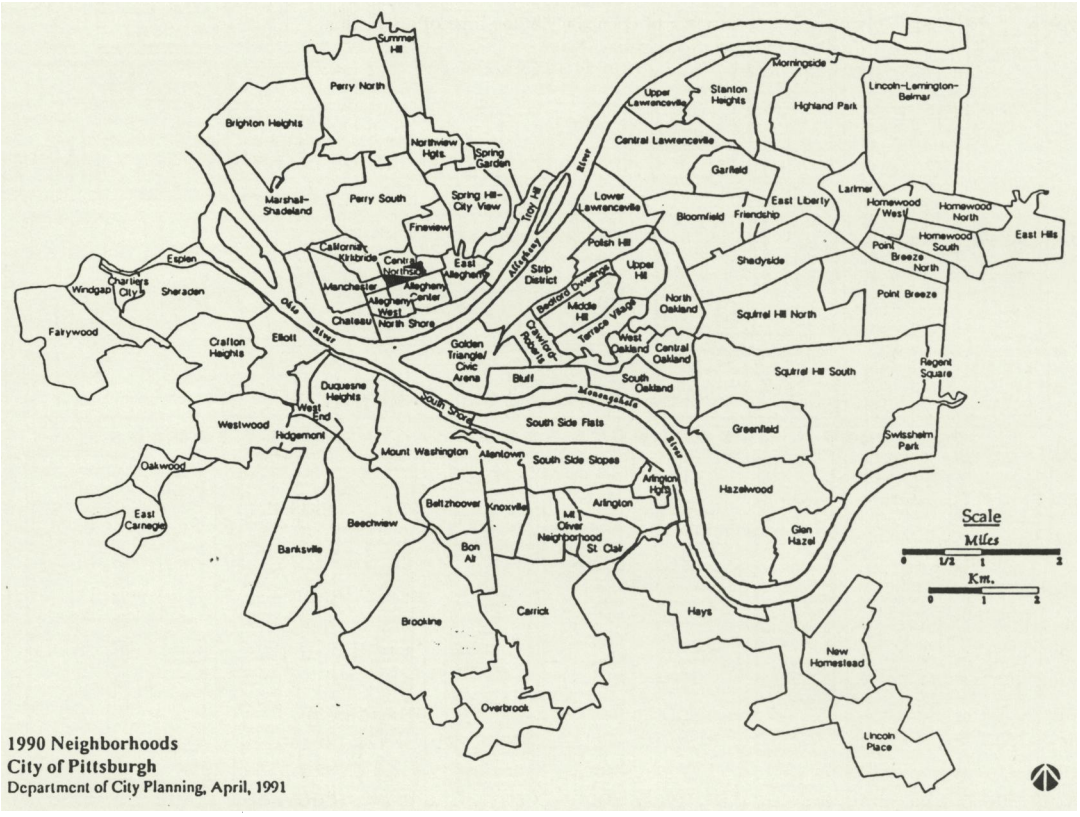

FIGURE 1. Map of Pittsburgh and its neighborhoods. (The shaded part is the Central North Side neighborhood which includes the Mexican War Streets area.)

viously listed questions and scenarios were tested using data at the property level. The details of the analysis can be found in Ulusoy (1991).

Pittsburgh is one of the oldest industrial towns of the United States. Similar to many of the North American industrial cities undergoing structural change, Pittsburgh has been losing population particularly during the last two or three decades. The area of study, the Mexican War Streets, is part of the Central North Side neighborhood of Pittsburgh. It is located approximately one mile north of the Central Business District, across the Allegheny River (Figure 1).

The dominant land use in the Mexican War Streets is residential, although there is a great variety in the surrounding land uses, particularly to the south and the east. The housing stock consists of small brick rowhouses, mostly built during the second half of the 19th and the early 20th centuries. The North Side of Pittsburgh used to be one of the most prestigious residential districts in the city, and a considerable number of historically significant houses in the Mexican War Streets have been listed in the National Registry of Historic Places and have City Historic Designation. The area has been the target of various public policies and programs since the late 1960s due to the physical qualities of the building stock and the organizational capacity of the residents. The purpose of these programs has been the renovation of buildings and the rehabilitation of the neighborhood to increase its desirability and to preserve its diverse population.

The analysis was performed in three stages: first, trends in renovation and sale activity for all 199 properties within the boundaries of the Mexican War Streets area were analyzed; second, the relation-

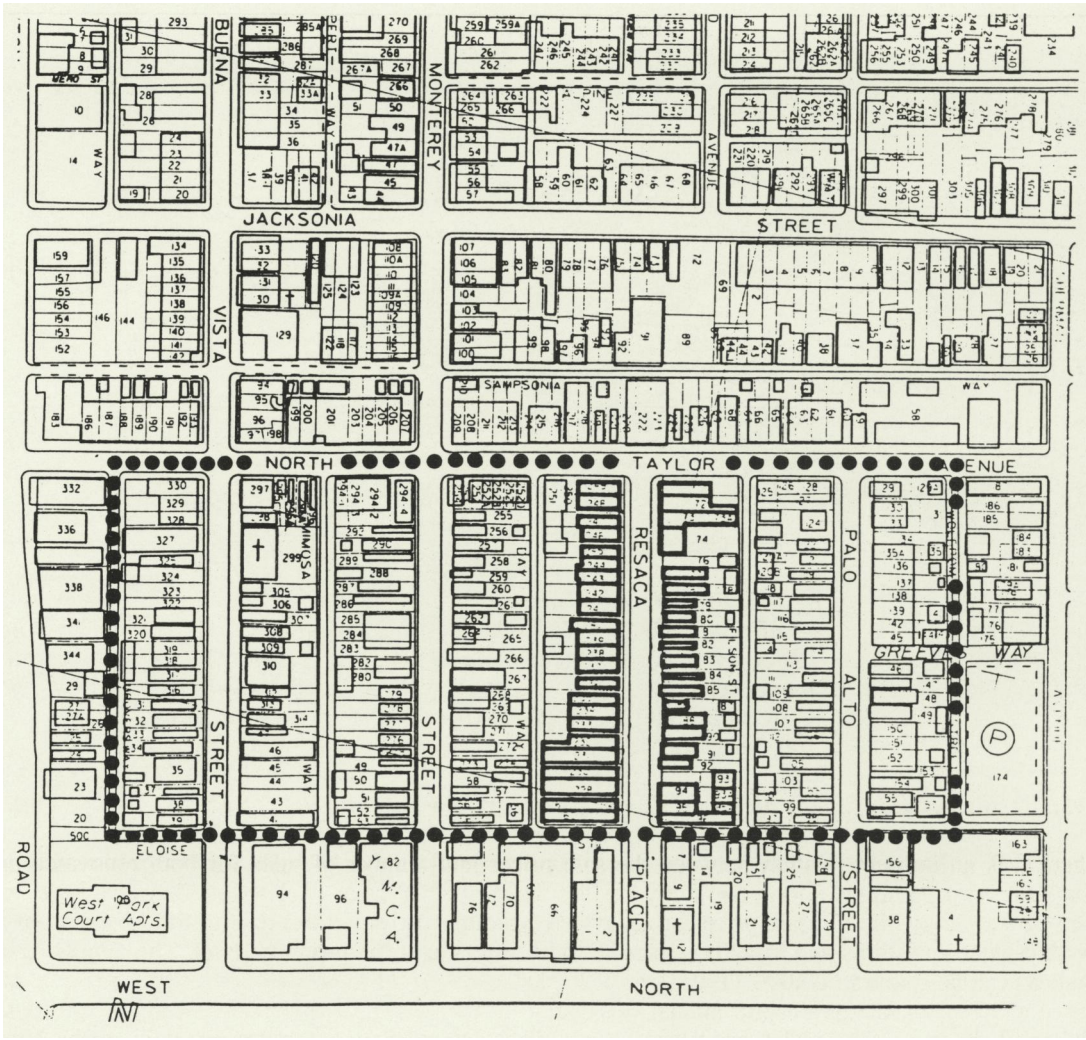

FIGURE 2. Properties included in the analysis — 199 properties in the Mexican War Streets and 46 properties along Resaca Place.

ship between renovation and property sale for the same group was examined; and third, the interaction among renovation, property sale, and turnover of residents for 46 properties along the street where renovations prevailed, Resaca Place, was studied (Figure 2), with the assumption that proximity is important leading to spill-over effect. The time period is from 1981 to 1990. The analysis is done using the official records of renovations and sales for each property and information on the turnover of occupants in the area.

SUMMARY OF FINDINGS AND IMPLICATIONS

Trends in Renovation and Sale Activity in the Mexican War Streets

The number of renovations in the Mexican War Streets, after a sharp increase in 1982 to 18 instances, varied between 6 to 10 renovations per year through the 1980s, but rose again in 1990 to 16 cases. Overall, renovations became less expensive and less substantial from the early 1980s to 1990. The

TABLE 2. Cross-tabulation between renovation types and years — Mexican War Streets, 1981-1990.

	Major renovations	*Minor renovations*	Total
1981-1985 (5 yrs)	32* (24)**	14 (22)	46 (51.7%)
Average cost***	$12,700	$1,800	
1986-1990 (5 yrs)	14 (22)	29 (21)	43 (48.3%)
Average cost	$4,800	$700	
Total	46 (51.7%)	43 (48.3%)	89 (100%)

* observed frequencies
** expected frequencies
*** In constant dollars (1967)

$\chi^2 = 11.54 > \chi^2_{1,\ 0.05=\ 0.99607}$ (i.e., the variables are related)

Note: Classification of renovation types was made using the terminology found in the records of the Building Inspection Office. Here, *major renovations* include: rehabilitation, general repair, remodeling, change in the number of units, extension, addition, interior alterations, new bathroom or kitchen; whereas *minor renovations* are: façade renewal, exterior alteration, wall repair, roof repair, stairwell repair, addition of deck, porch, fire escape, dormer, skylight, repair garage, and application of drywall, plaster, fence, insulation.

average cost of renovation was $12,500 in 1982 and $11,700 in 1983 (in 1967 constant dollars), whereas during the second half of the 1980s, it fluctuated between $1,200 and $3,400 per year. Major renovations decreased as minor renovations increased during the same period (Table 2). While most instances were of general repair, rehabilitation, and change in the number of units during the first half of the 1980s, after 1985 renovation activity was mostly in the categories of exterior alteration, wall, roof, and stair repair, and addition of deck, porch, dormer, and skylight.

Relationship between Renovation and Property Sale in the Mexican War Streets

There was an indirect relation between the sale prices and number of sales for both renovated and non-renovated buildings during the study period: the number of sales declined while prices rose, and vice versa. Yet, while the sale price for renovated buildings increased throughout the 1980s, from an average of $14,000 in 1981 to $25,000 in 1989, the sale price of non-renovated ones declined during the same period, from $26,000 in 1981 to $16,000 in 1989. The number of sales of renovated and non-renovated buildings, despite annual fluctuations, were the same during the early years of the 1980s, an average of 7.7 sales per year. After 1984 the number of sales of non-renovated buildings rose to an annual average of 11.7, while the number of sales of renovated buildings remained at an average of 7 sales per year. During the early years of 1980s, non-renovated buildings were expensive and there were fewer sales. As the price declined, sales increased. It was the reverse for renovated buildings: a lot of them were bought for cheaper prices during the early 1980s. As they became more expensive fewer of them were sold. In the early years, the market for buildings which had not been renovated was tighter. Later on this was reversed and the market for renovated buildings tightened.

Slightly more renovations occurred in the first half of the 1980s than the second half: a total of 46 renovations between 1981 and 1985 and 43 renovations between 1986 and 1990 (Table 2). A larger percentage of renovations was associated with property sales (50 out of 70) than the percentage of sales associated with renovations (50 out of 132) (Table 3). That is, buildings that were sold were more likely to have been renovated during the study period than ones that were not sold. Yet, sales of non-renovated buildings were more frequent than of renovated ones. Hence, although occurrences of renovation and sale were interrelated and renovation facilitated sale, it was not a sufficient cause of a sale. This might be an indication that properties were sold with the intention of renovation, but renovations were not done with the intention of sales.

TABLE 3. Cross-tabulation between renovation and sale — Mexican War Streets, 1981-1990.

		Renovation YES	NO	Total
Sale	YES	50* (46)**	82 (86)	132 (66%)
	NO	20 (24)	47 (43)	67 (34%)
Total		70 (35%)	129 (65%)	199(100%)

* observed frequencies
** expected frequencies
$\chi^2 = 1.258 > \chi^2_{1,\ 0.05=\ 0.99607}$ (related)

TABLE 4. Patterns of sequence between renovation and sale — Mexican War Streets.

Patterns of Renovation and Sale	Number of Instances	Percent of Total
1 - Sale followed by renovation	23	57.5%
2 - Sale during renovation	5	12.5%
3 - Sale, renovation, sale	5	12.5%
a. Sale followed by renovation followed by sale again (3)		
b. Sale followed by renovation during which there is another sale(2)		
4 - Renovation followed by sale	7	17.5%
a. Two renovations followed by a sale (1)		
b. Renovation followed by sale (5)		
c. Renovation followed by sale and another renovation (1)		
Total	40	100%

It was more common to find the sale of property followed by renovation, Pattern 1, than renovation followed by sale, Pattern 4: 57.5 percent and 17.5 percent respectively (Table 4). The renovations that followed sales were more expensive ($6,790 on average and interior-oriented) whereas renovations prior to sales were less costly ($5,130 on average and mostly exterior-oriented) (Table 5). Buildings that were sold after renovation were generally more expensive, an average of $19,220 compared to $13,880 in sales followed by renovation, although less money was spent on these renovations than the renovations after sale. New owners of the properties in the latter case spent less on their properties in total: sale price and cost of renovation added to a lower amount compared to the total investment for properties that were sold after renovation, an average of $20,670 and $24,350 respectively. According to the hypotheses stated earlier, these property owners might be gentrifiers who purchase buildings with the intention of residing there. On the other hand, having had renovation increased the price of properties, more than the increase due to the capitalization of the renovation cost in the sale price. Thus, these renovations were done with speculative intentions, since profits were higher than the investments made.

Interaction among Renovation, Property Sale, and Turnover of Residents along Resaca Place, 1981-1990

Between 1981 and 1990, residential turnover along Resaca Place was mostly related to sale rather than to renovation. In 74 percent of the cases turnover of residents coincided with property sale (Patterns 1 and 3), whereas in only 33 percent of the cases residential turnover coincided with renovation (Patterns 2 and 3) (Table 6). This is expected in cases where sales involve owner-occupants. Property sale appeared to be the primary factor in both residential turnover and renovation (Table 7). Renovation increased the chance for sale and turnover of residents but was not sufficient for either one to occur.

TABLE 5. Renovation categories and average renovation costs for Patterns 1 and 4 in the Mexican War Streets.

Renovation categories	General*	Interior**	Exterior***	Average
Pattern 1 - Sale followed by renovation				
Renovation cost ($)	10,550	6,220	3,610	6,790
Sale price ($)	14,800	13,460	13,960	13,880
Number of cases	5	12	6	total:23
Pattern 4 - Sale after renovation				
Renovation cost ($)	10,590	3,270	1,520	5,130
Sale price ($)	27,740	17,530	17,540	19,220
Number of cases	2	2	3	total:7

* General renovation includes rehabilitation, general repair, and remodeling.
** Interior renovations are changes in the number of units, extensions, interior alterations, new bath or kitchen, drywall, plaster, fence, insulation.
*** Exterior renovations include repair front, exterior alterations, wall, roof, stairwell repair, addition of deck, porch, fire escape, dormer or skylight, and garage repair.

TABLE 6. Patterns of coincidence among renovation, property sale and turnover.

	1981-1985	*1986-1990*	*Total*
Pattern 1 - Sale, turnover, no renovation	11*	13	24 (63%)
Pattern 2 - Renovation, turnover, no sale	7	1	8 (21%)
Pattern 3 - Renovation, sale, turnover	3	1	4 (11%)
Pattern 4 - Renovation, sale, no turnover	1	1	2 (5%)
Total	22 (58%)	16 (42%)	38 (100%)

* Figures stand for the number of instances for each pattern during the period indicated.

TABLE 7. Cross-tabulations among renovation, turnover and sale.

a) Renovation and Turnover

		R		
		Yes	No	Tot
T	Yes	11	22	33
	No	3	10	13
	Tot	14	32	46

$\chi^2 = 0.417 < \chi^2_{1,\ 0.05} = 0.99607$ (not related)

b) Renovation and Sale

		R		
		Yes	No	Tot
S	Yes	12	19	31
	No	2	13	15
	Tot	14	32	46

$\chi^2 = 3.068 > \chi^2_{1,\ 0.05} = 0.99607$ (related)

c) Turnover and Sale

		T		
		Yes	No	Tot
S	Yes	26	5	31
	No	7	8	15
	Tot	33	13	46

$\chi^2 = 6.984 > \chi^2_{1,\ 0.05} = 0.99607$ (related)

According to Table 6, one-third of simultaneous occurrence of events included renovation, 14 buildings in Patterns 2, 3, and 4, yet these constituted all the renovations along Resaca Place during the study period. Thus, upgrading of the property by original residents was not seen along Resaca Place between 1981-1990. So, when a property was renovated, it was either sold, changed its occupants, or both. Conversely, most of the sales and turnover cases did not involve renovation.

Property sale and/or turnover of residents were more likely to happen together with substantial renovations since renovation coincided with sale and/or turnover more frequently during the first half of the 1980s when renovations were more extensive and costly (Tables 2 and 6). This concurrence might be attributed to the nature and extent of renovation. Minor renovations were carried on without change in ownership or occupancy.

Tenure status of properties exhibited some interesting characteristics: whenever sale and turnover coincided during the late 1980s, it was in owner-occupied buildings. All simultaneous occurrences of three events happened or ended in owner-occupied buildings. These cases might indicate a higher level of market activity for owner-occupied properties than for rental properties in the second half of the 1980s. Absentee-owners mostly did interior renovations, which were intended likely to increase the rentability of the buildings.

The ordering and concurrence of events indicate the intention behind renovation that varies for different actors involved in rehabilitation. Four types of scenarios — actors and their objectives in renovation — were developed in the previous section. Since the data on residential turnover were collected only for the properties along Resaca Place, scenarios are tested mostly for this section of the area. Findings from the analysis show that (see also Table 1):

Type A - Cases where there was no change in ownership or turnover of occupancy at the time of renovation, hence owner-occupiers renovating their houses, meant the goal was not to attract a different type of household but to improve the physical quality of the buildings. There were no examples of this type among the properties along Resaca Place, thus *no incumbent upgrading* was seen between 1981 and 1990.

Type B - When renovation coincided with a turnover of the residents without property sale, the objective is likely to make the property fit for a new clientele. If it becomes rental after renovation, the goal of the *landlord* is to collect higher rents. There were only 8 cases (21% of total) that fit this type in the Resaca Place. Renovations were equally done by owner-occupants and absentee-owners. Most of these instances occurred during the first half of the 1980s.

Type C - Renovations that occurred together with property sale and change of occupants indicate that the intention was to make the buildings match the needs and tastes of the new owner-occupants. Depending on their socio-economic characteristics, these new residents might be *gentrifiers.* There were very few of these cases along Resaca Place. However, when the Mexican War Streets is considered, renovations following a sale, or sales during renovation were the most frequently seen patterns in the area. These were mostly expensive renovations and mostly started within a month after the purchase of property. The total amount of money spent to buy and to renovate these properties was less than the money spent to buy an already renovated house, especially in cases of general renovation.

Type D - Cases where renovation occurred prior to sale are suggested to be profit-oriented and might be *speculative.* This pattern was not very common in the Mexican War Streets. These properties were sold in a shorter time if they had general renovation or interior renovation. But there were more exterior renovations. Cost of renovation was less compared to renovations done after sale, yet the cost of buying a renovated house was higher than renovating after purchase. Hence, there is a *speculative* market, albeit small, for renovated buildings. Along Resaca Place, however, there were many instances where properties were sold without any renovation, and the residents changed. Most of these sales involved owner-occupiers in the second half of the 1980s. Hence, the speculative market was stronger for owner-occupied buildings than rental properties.

Summarizing these findings, we can conclude that subsections of the study area varied in terms of the intentions behind renovation. Renovations done by new owner-occupants, who might be gentrifiers, were frequently seen in the Mexican War Streets. Nevertheless, information of the socio-economic characteristics of households that move in and out is needed to determine whether this meant gentrification of the area. Analysis of census data indicates an increase in people with higher education, a high turnover rate, an active property market, and an increasing discrepancy between the incomes and the property values for the area that covers the Mexican War Streets (Ulusoy, 1991). Thus, although data for the socio-economic characteristics of individual households were not included in the analysis, it is *likely that the area was gentrifying.* Yet, since these events in the area did not change the overall status of the neighborhood significantly, we can conclude that *gentrification hap-*

pened at a slow pace and was limited in extent. There were *a few renovations which might be speculative* in the Mexican War Streets. Although there was a market for speculative sales, it was not as strong as the market for buildings to be renovated. Along Resaca Place, however, *the property market was quite tight and speculative* during the 1980s. Gentrifier type of renovation was less common. Most of the transactions did not involve renovation, neither by the previous nor the current owners. There were *no instances of incumbent upgrading* — a renovation that did coincide neither with sale nor turnover of residents — and *few instances of renovation of rental property.*

Overall, renovation activity in the Mexican War Streets was limited in extent and impact. First, renovation was not independent of other indicators of residential change, sale of property, and residential turnover. Second, renovation of properties generally started after their purchase, rather than properties being sold after renovation. Nevertheless, a market for buildings to be renovated was created.

Public policies and programs did promote renovations and transactions with the aim of renovation. They were effective in preventing further decline and motivating rehabilitation. They created outside interest in the area and caused household gentrification that is spatially confined to the Mexican War Streets. The area had received special treatment in the form of concentrated renovation activity and community organizations specifically targeted improving the conditions in the area. As a consequence, the Mexican War Streets accounted for most of the early lending activity, and the conditions there improved faster than in other parts of the neighborhood.

The above changes in the Mexican War Streets, in regard to the particularities of rehabilitation effort and its relation with property sales and turnover of residents, need to be placed within a larger framework to draw further conclusions. This framework has to take the urban context — demographic, economic, and physical aspects of the area — and the policies, programs, and agents involved in the rehabilitation activities into account. The purpose of this paper has been limited to the introduction of a framework of analysis where various dimensions of neighborhood change are studied at property level, and a case study where this approach is used to evaluate the dynamics of change in an inner city neighborhood.

CONCLUSIONS

The framework of study introduced above enables us to discuss changes in an area at a level of detail that cannot be attained using conventional approaches to neighborhood research. While analyses based on aggregate data of a neighborhood can reveal overall trends, they fall short of uncovering the spatial differences within the area and variations that occur over time. Such differences can be captured by incorporating data at a smaller scale than that of a neighborhood. Moreover, interaction among different measures of neighborhood change necessitates an approach that enables a detailed analysis of the intricate network of relationships. The categorical differences among renovations done by different actors involved in the process need also to be discussed.

The framework of analysis incorporated in this study can be expanded into a model for neighborhood study. Such a model can be used to determine the direction and the nature of changes in a neighborhood, and, depending on the extensiveness of information and the changes in the larger context, can be used to predict potential changes. Three indispensable variables in such a model are: (1) the timing of renovation in relation to property purchase and resident turnover; (2) the cost of renovation; and (3) the type of renovation. Integration of these three variables enables a discussion of motives behind each renovation activity, and, in the aggregate, hints at the nature of changes at the neighborhood level.

Other information on the demographics of the neighborhood and on rehabilitation policies enrich the analysis, elaborate the discussion, and provide support for the conclusions. The trends in population in terms of overall number of residents, the racial make-up of the area, income, and educational charac-

teristics of households are also important for assessing the direction of changes in a neighborhood. The socio-economic characteristics of the renovators are clues to discussing whether an area is upgraded by its original residents and/or households of similar status, or by people of a higher socio-economic status; that is, whether it is a case of incumbent upgrading or gentrification. The source of investment is significant in determining the involvement of public and private capital in the rehabilitation of an area and eventually discussing the extent of governmental motivation behind it. Types of developers involved in renovation, whether they are small developers working with single buildings or large developers that purchase a number of buildings, renovate and sell them, indicate the perceived risk factor in making large scale investments in a neighborhood.

The approach introduced above is based on the hypothesis that renovation can be manifested in quantitatively and qualitatively different forms. One has to be attentive to these variances in order to arrive at credible conclusions regarding the nature of changes in a neighborhood. A modest renovation that is done without any change of property ownership has completely different motives than an extensive and costly renovation which follows the purchase of property. Thus, the existence of various forms of renovation in a neighborhood imply totally divergent trends. The framework introduced here aims to allow an in-depth neighborhood study to undo the intricate network of interactions, interpret the conflicting indicators of change, and uncover geographical variations in an area. As such, this approach can be turned into a tool which might be used to shape future actions and policies not only for individual neighborhoods but also a network of neighborhoods in cities.

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